

## Impact of Capital Adequacy on Banks' Performance: Considering the Basel International Regulatory Framework for Banks

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### **Abstract**

This study examines the impact of banks' capital on the performance of banks. The studies adopted a fixed-effect model estimation. This research using time-series data covering the period 2008-2017 for Ghanaian listed universal banks. The result shows that the bank's capital and banks' net profit after tax has a positive and significant relationship with banks' total asset base as a performance indicator. Through correlational analysis, we further discovered a strong negative link between banks' outstanding loans (credit advancement) and banks' performance. This study's fundamental implications are to encourage the monitoring of banks' capital adequacy since it creates opportunities for banks to perform effectively.

### **Keywords:**

capital adequacy, bank performance, Basel III, capital, equity

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## **Introduction**

The term or phrase capital adequacy define as the adequacy of a bank's aggregate capital concerning the risks, which arise from its assets, off-balance-sheet transactions, dealing operations, and other risks with its business. Before the concept of capital adequacy becoming embodied in Basel 1, banks existed in an era characterized by individual and inconsistent ways of addressing capital adequacy. Dow (2017) revealed that banks understood the importance of setting aside capital in the early 1970s through to the early 1980s, which use to address the risks inherent in the banking business.

The G-10 countries adopted the International Convergence of Capital Measurement and Standards. These regulations set up by the Basel Committee on Banking Supervision dub Basel I. Basel I is critical on making available capital for credit risk because lending regard as an essential function of the bank. The bank's capital is set up at 8 % of risk-adjusted assets, of which 4% must be Tier 1 Capital. Basel 1 had some challenges; with the emergence of new financial instruments, sufficient risk management and mitigation techniques were not readily available, which led to banks' exposure to operational, market sovereign risk, and other risks. The final version of the International Convergence of Capital Measurements and Capital Standards draft by the Basel Committees is referred to as Basel II, which focuses on three pillars to solve Basel I's challenges.

Pillar 1 talks about minimum capital requirements, which enable banks to obtain capital levels aligned with their risks. Its core objective is to make sure that regulatory capital set up by the regulator matches up to economic capital as per the bank's internal business processes. Pillar 2 details supervisory framework issues. The supervisory review process defines an institution's capital to support all the business risks and encourage the development and use of better risk management techniques in monitoring and managing the risks. While pillar 3 captures market discipline, it explains the lowest disclosures by banks when in case of publication on their accounts to project absolute transparency and accountability from bank management.

The last as of the Basel framework is the Basel III, which is a global voluntary regulatory framework for bank capital adequacy ratios, stress tests, and market liquidity risks. In response to the financial regulatory deficiencies revealed in the 2007-08 Financial Crisis, the third part of the Basel Accord was formulated. Its purpose is to strengthen bank capital requirements by increasing bank liquidity and reducing bank leverage. Members approved Basel III of the Basel Committee on Banking Supervision in November 2010. However, the deployment was repeatedly extended to 2019 and then to 2022 (Ramirez, 2018).

The CAMELS rating system is a coin by Oyetan as a measure of a banks' financial condition. North American Commercial Banks was the first to adopt this system. CAMELS rating is an abbreviation that stands for: Capital Adequacy, Asset quality, Management quality, Earnings ability and Liquidity, and system, and sensibility (Nicolae, & Maria-Daciana, 2014).

A risk-based capital requirement seeks to match the bank's capital to its relevant risks expose by the bank. Having a risk-based capital regime ensures that financial

institutions have sufficient capital on hand to withstand losses while maintaining a safe and efficient market. This requirement serves as a protection to financial institutions, investors, depositors, and the economy. According to Demirguc-Kunt et al. (2017), adequately capitalized banking institutions can venture into more significant business expansion. This condition will give move resources to develop the capacity to be more competitive effectively and efficiently in a democratic environment among high-class banks, thereby prompting them to be improving technologically and come up with innovative financial products ideas to remain competitive.

Al-Kattan (2015), in another context, claims that if sufficiently capitalized, banks will have the following advantage over less-financed or inadequately finance banks; be more competitive more products on offer both local and offshore' more comprehensive network cover, price products competitively, and finance a large number of diverse transactions across sectors. Besides, on asset management, capitalized banks will be likely to off their clients with more extended loan repayment periods and have more efficient systems than other banks with the help of new information technology systems. Adequate capitalization is using as a tool to reduce excessive risk-taking by shareholders. This condition will ensure the spread of risk between the owners and the depositors, henceforth limiting the risk of the banks collapsing; the is a bank by research on Financial Markets and Policy conducted by the Kenya Centre for Research. In another view, it acts as a buffer against financial costs of financial distress, thereby reducing the probability of bank insolvency.

Nevertheless, some scholars have argued that capital requirements are considerable costs to banks, which cause some but to fold-up and forcibly merge against their will. Imposing higher capital requirements constrain banks' competitive pressure due to competition on loans, deposits as well as sources of debt and equity investment (Bolt & Tieman, 2004). In moments of high capitalization, banks might respond by giving limited credit, reducing their interest rate on deposits and other time deposits to maintain the required high capital base, which will restrain the banks' operations. The "too-big-to-fail" syndrome may affect financial institutions with adequate capital, and this might lead to riskier investments (Berger, 2008; Berger et al., 2008).

The final goal of banks' management is to record profit at the end of the financial year. The relationship between the return on equity and the capital asset ratio for several banks and the results depicted that return on equity, and capital asset ratio tends to be positively related (Olaire et a., 2017). Insufficient capital requirements or the inability of a bank to meet the capital requirement might cause deposited to refrain from dealing with the banks, which will hurt the bank's overall profitability. This positive correlation between capital and profitability has also been concurred by A study carried out in India that indicated that banks with higher capital requirements could easily absorb unexpected losses and have reduced cost of capital, which means their profit levels are usually high (Kwan & Eisenbeis, 1997). Evidence from studies carried out on United States Banks states that a bank's capital level might depend on their business plan apart from regulatory pressures. A bank that intends to take over another bank might adequately be capitalized to impress regulators without necessarily being profitable.

Banks keep internal non-required, referred to as a bank's buffer capital. This type of capital does not fluctuate over time. Buffer Capital refers to the ratio of excess capital over risk-weighted assets. Some scholars also argue that a bank's excess capital acts as insurance against costs that may occur due to losses on loans or due to random shocks, and the insurance premium is usually equal to the return on equity or interest rate on the subordinated debt that the bank pays to attract new capital. To know the level of buffer capital required from one period to another, banks need structures, systems, and tools sufficient to assess the risk innate in the banking portfolios – often at very granular levels. This condition may demand a review of banks' frameworks and considering making the required investments to bring these up to the level capable of accurately quantifying risk exposure. Shim (2013) suggests that in the event of economic recession, banks must force by regulators to top up their minimum capital levels because there is a positive linkage between risk exposure and buffer capital.

Jalloh (2017) states that banks' regulators should focus on capital adequacy and supervisory review and market discipline to maintain banks' financial strength and stability in Nigeria. In Kenya's case, the Central Bank of Kenya tended to maintain its rules so that banks in Kenya whose capital had fallen below the regulatory thresholds were required to raise additional capital (Molonko & Jagongo, 2017). There is a positive link between more significant equity and EU banks' profitability Olalekan & Adeyinka (2013). Besides that, Davydenko (2011) also found a positive impact between equity level and profitability. Goddard et al. (2004) support a prior finding of a positive relationship between the capital/asset ratio and a bank's earnings. However, the direction of the relationship between bank capital and bank profitability cannot unanimously be predicted in advance (Staikouras & Wood, 2004).

The challenging question in capital regulation is that while regulators believe that banks' increased capital requirement is driven by efforts to lower systemic risk and protect the depositors and the financial institutions as well. Banking regulation critics build their attitudes on the presumption that it decreased profitability in banks because tightened capital requirements will lead to banks' inability to maintain their current business volumes (Elliott et al., 2015).

This condition gives rise to an argument that if banks' sound profitability is not limited by capital requirement, it would not be a better way to guarantee stability as it would allow banks to naturally build a solid cushion base and cover potential losses from recurrent earnings (Rose-Ackerman, 2010). Demirguc & Huizinga (2010) argue for the need to increase the capital requirement for banks, the question remains, what is the right benchmark to enforce capital regulations without it affecting the performance of banks. To adequately address this question, it was necessary to thoroughly analyze the relationship between capital requirements and banks' performance.

This study focuses on the Capital requirement and performance of selected universal banks in Ghana, considering the Basel Accord Framework. This study is the first of its kind in sub-Sahara Africa, and its findings would help the local and foreign universal base in the region. The study seeks to address the following objectives. First, to establish

whether there is a link between the bank's capital and bank performance. Second, to assess the impact of Banks' profitability on banks' performance. Third, to identify the correlation between non-performing loans and banks' financial performance.

As mentioned earlier, there is an insubstantial amount of study on banks' capital adequacy and its impact on bank performance. Hence, we explore this gap by investigating how the implementation of capital adequacy requirements influences banks' performance. This study is in line with the Basel Accord III framework and Ghana bank regulations 2018. Both policies stressed bank capital adequacy, stress testing, and market liquidity risk. Our study drew on the data from top banks in Ghana (an emerging economy in Africa) for the period from 2000 to 2017 and employed a rich set of empirical approaches, including a panel data analysis of fixed effects models or first differenced models. This research intends to be used by policymakers, especially those in developing countries, to formulate capital requirements, capital adequacy, and bank performance.

## Methods

We adopted a panel data regression fixed effect estimation model. The study targeted all universal banks listed on the Ghana Stock Exchange. A total of Eight commercial banks were found at the time of the study. Therefore, only these banks' financial statements covering the period 2008 to 2017 were collated. The Basel Capital Accord is an international standard for calculating the capital adequacy ratio. The accord incorporated various variables that affect a bank's soundness and safety in its framework in its analysis. The framework considers a bank's capital adequacy, asset quality, management, earnings, profitability, liquidity, and market risk sensitivity.

This paper employs panel data estimation models to analyze the panel data and examine the effects of bank-specific factors on bank performance. Data Panel Regression is a combination of cross-section data and time series, where the same unit cross-section is measured at different times. So, in other words, panel data is data from some of the same individuals observed in a certain period of time. If we have T time-periods ( $t = 1, 2, \dots, T$ ) and N the number of individuals ( $i = 1, 2, \dots, N$ ), then with panel data, we will have total observation units of  $N \times T$ . If sum unit time is the same for each individual, then the data is called a balanced panel. If the number of time units is different for each individual, then it is called the unbalanced panel. The Following baseline models were used:

The Common Effect model

$$Y_{it} = \alpha + \beta'X_{it} + \varepsilon_{it} \quad (1)$$

Description:

For  $i = 1, 2, \dots, N$  and  $t = 1, 2, \dots, T$ .

Where N = Number of individuals or cross-section and T is the number of time-periods. From this model,  $N \times T$  can be generated equation, which is equal to T equation of cross and as much N equation coherent time or time series.

The fixed-effects model

$$Y_{it} = \alpha_i + \beta_1 X_{it} + \varepsilon_{it} \quad (2)$$

Where;

$\alpha_i$  ( $i=1, \dots, n$ ) is the unknown intercept for each entity (  $n$  entity-specific intercepts).

$Y_{it}$  is the dependent variable (DV) where  $i$  = entity and

$t$  = time.

$X_{it}$  represents one independent variable (IV),

$\beta_1$  is the coefficient for that IV,

$\varepsilon_{it}$  is the error term

The Random Effect Model

$$Y_{it} = \alpha_i + \beta' X_{it} + U_i + \varepsilon_{it} \quad (3)$$

Description:

For  $i = 1, 2, \dots, N$  and  $t = 1, 2, \dots, T$ .

Where:  $N$  = number of individuals or cross-section.  $T$  = the number of time-periods.

$\varepsilon_{it}$  = is the residual as a whole where the residual is a combination of cross-section and time series.  $U_i$  = is the individual residual which is the random characteristic of unit observation the  $i$ -th and remains at all times.

**Table 1. Description of Variables**

Variables	Code	Description of Variables	What it measures
<b>Dependent Variable</b>			
Total Asset Base	TAB	A company's asset base is often construed as its book value. Total asset base is equal to Total assets less Total liabilities	Asset quality
<b>Independent Variables</b>			
Net Income After Tax	NPA	Net income after taxes (NIAT) is a financial term used to describe a company's profit after all taxes have been paid	Profitability
Bank's Total Capital	BTC	Bank capital represents the value invested in the bank by its owners and/or investors.	Liquidity
Total Outstanding Loans/ Nonperforming Loans	TOL/NPL	A non-performing loan (NPL) is a loan that is in default or close to being in default.	Sensitivity to Market risk

## Result and Discussion

Table 2 shows the descriptive statistics from this research. The number of observations is 50 periods from 2008 until 2017. The result shows the mean, standard of deviation, minimum value, and maximum value from the variables.



**Table 2. Descriptive Statistics**

Variable	Obs	Mean	Std. Dev	Min	Max
Net profit after tax	50	8.570	9.980	-7.900	3.280
Total Asset Base	50	2.670	2.190	3.390	9.560
Non-performing Loans	50	1.230	9.570	1.910	4.570
Total Deposit	50	1.920	1.650	1.770	7.160
Bank's Total Capital	50	3.640	2.870	85360	1.110

The number of observations for all variables is 50 except lnNPA (the natural logarithm of net profit after tax). This condition because from the original data, one bank records losses for two years in a row. The explanatory and dependent variable's natural logarithm was generated to bring all the variables to a common base. Because the years are not sequential, we time-set our data by creating a time dummy variable called time.

Considering equation 1, 2 and 3 our regression models will be;

Common effect model:  $TAB_{i,t} = \alpha_i + NPA_{i,t-1} + BTC_{i,t} + BOL_{i,t} + \epsilon_{i,t}$

Fixed effect model:  $TAB_{i,t} = \alpha_i + NPA_{i,t-1} + BTC_{i,t} + BOL_{i,t} + \epsilon_{i,t}$

Random effect model:  $TAB_{i,t} = \alpha_i + NPA_{i,t-1} + BTC_{i,t} + BOL_{i,t} + \epsilon_{i,t} + u_{i,t}$

**Table 3. Selection Method of Regression Data Panel**

Test Results	Common Effect	Fixed Effect	Random Effect
Chow Test	0.678	0.000*	N/A
Hausman Test	N/A	0.001*	0.081

Chow Test Chow test is a test to determine the model of whether the Common Effect (CE) or Fixed Effect (FE) is most appropriately used in estimating panel data. The chows test result in Table 3 shows that the best model between the common effect model and fixed effect model is the fixed-effect model. Otherwise, the Hausman test is a test to determine the model of whether fixed effect or random effect. The Hausman test result in Table 3 also shows that the best model in this research is the fixed effect model.

The regression result in Table 4 shows that a bank's capital positively impacts bank performance as proxied by the bank's total assets base. This result indicates that a percentage change in bank capital will lead to a 65 percent change in a bank's performance. This is also a suggestion that when a bank's capital (lnBTC) increases, its total assets base (lnTAB) rises, confirming that capital enhances banks' performance primarily. This finding is in line with the research of Goyal (2013), Mondal & Ghosh (2012), Tran et al. (2016), Berger & Bouwman (2013), and Goddard et al. (2004). For instance, Tran et al. (2016) stated that a bank's capital level determines its performance. Goyal (2013) argues that capital structure has a significant impact on banking performance.

This result is because clients found financial institutions with adequate capital more worthy of doing business. Also, good capital adequacy means banks can take care of their operational risks promptly.

**Table 4. Regression Result**

Total Asset Base	Fixed-Effect		Random Effect		Common Effect	
	Coef.	P> t	Coef.	P> t	Coef.	P> t
Net profit after tax	0.16934	0.007***	0.013	0.002***	0.212	0.018*
Bank's Total Capital	0.65107	0.000 ***	0.530	0.001***	0.423	0.000***
Non-performing Loans	(0.12780 )	0.003***	0.012	0.230	0.052	0.501
_cons	2.45800	0.054	5.520	0.120	7.0523	0.002

Superscripts \*, \*\*, \*\*\* indicate statistical significance at 10%, 5% and 1% levels, respectively. P-values are reported in parentheses.

With lnNPAt-1, the coefficient is 0.1651 expresses that banks' previous year's profit positively influences their performances. When a bank makes a profit in a given year, there is a likelihood that its profit will affect its subsequent year's performance positively. This result is explainable because profit/income made by banks are either re-invested back into the company (retain earnings) or disbursed to shareholders as dividends or in the form of additional shares. The result shows a strong relationship between a bank's previous net profit and bank performance. Gizaw et al. (2015), Anbar & Alper (2011), and Chen et al. (2018) also get similar findings. Gizaw et al. (2015) show that the profitability of commercial banks in Ethiopia has a significant impact on their performance in a given year. The result shows that banks' non-performing loans are statistically inversely related to the performance of universal banks.

## Conclusion

Our research found out that banks' capital adequacy has a robust significant influence on banks' performance. We also realized that the lagged net income of a bank significantly affects its performance positively. Also, the study discovered that banks' non-performing has an antithetical impact on bank performance.

Our research supports the fact made by the BASEL framework that banks' capital can be considered an active factor in the performance, banks safety, and banks' soundness. However, some authors believe that this could lead banks to trading over-cautiously to prevent sanctions from supervisory agencies. Thus, the Central Bank of Ghana and other agencies should critically look at the prudential guidelines' provisions. These findings will help all banks in most universal banks based in Ghana to be more prepared for future minimum capital requirements adjustments. In the case of the selected banks, the revelation is that capital, asset, and loans are an element that conditions banks' performance, and they must serve as indicators when planning for or restructuring the program of capital requirement and or capital adequacy.



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